

chance the operation affords without reference to its age, except, of course, in regard to prognosis.

With this we must close the subject chosen for examination. But it would be injustice to the author if we did not state that we have not touched upon many points of interest which are fully considered by him. The state of the blood, the diverse localizations of diphtheria, albuminuria and diphtheritic paralysis are some of the most important. The latter is one of the most interesting subjects connected with the disease, and its consideration occupies twenty-six pages of the work.

We must also close our review. We should, perhaps, have more fully attained the object of such an undertaking had we viewed the work more as a whole, examined it more critically throughout, and compared it closely with other works of similar aim and character. This we should have done had it been in our own language, and accessible to those who read our remarks; as it is not, we have thought the interest of our readers best subserved by presenting brief portions of the work, and the object of giving information as to the book and its author best attained by extract rather than by comment. If we have confined our attention too much to a limited portion of but one of the three volumes, our apology will be the better opportunity afforded for individual judgment by a pretty thorough presentation of his mode of dealing with one class of diseases, and an acquaintance with the author himself, as direct as the medium of translation will allow.

We close our task with regret. It is not often that such a work, by such a man, is presented to the medical world. The crowning effort of a lifetime of labour in the pursuit of the best means of curing disease, the production of an acute observer, an untiring worker, an experienced teacher, and a talented writer, it stands a shining light in medical literature, and a lasting monument to the fame of the author, rivalled only by such works as those of his great model Graves, or of his countryman, Andral.

J. C. R.

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ART. XVI.—*Lectures on the Pathology and Treatment of Lateral and other Forms of Curvature of the Spine.* By WILLIAM ADAMS, F.R.C.S., Surgeon to the Royal Orthopædic and great Northern Hospitals, &c. &c. Delivered at the Grosvenor Place School of Medicine in the Session 1860-61. Illustrated by Five Lithograph Plates and Sixty-One Wood Engravings. 8vo. pp. 334. London: John Churchill & Sons, 1865.

THE subject of *lateral curvature of the spine* is one of great practical importance. It is of frequent occurrence, and its results are serious. It not only produces deformity, but it impairs the general health of the patient, either by causing pain or by interference with the functions of the important organs contained in the thorax and abdomen.

This volume of Mr. Adams contains a revised course of seven lectures, delivered in 1860-61, and published shortly afterwards in the *Medical Times and Gazette*, together with four lectures, hitherto unpublished, which have been added in order to render the subject more complete in all its details. The main object of the author is to establish the treatment of spinal curvature upon a more exact knowledge of its pathology. His

work differs, therefore, from most others upon this subject, inasmuch as it has not been written for the purpose of bringing into notice, or of eulogizing some particular mode of treatment.

As a correct knowledge of the pathology of a disease is the only sure foundation for the proper treatment, and as Mr. Adams has well accomplished the main object he had in view in this work, more satisfactorily, we believe, than any other writer on the subject, we purpose to lay before our readers a full analysis of his volume.

The first two lectures contain some general observations upon the subjects of the book, and a sketch of those peculiarities in the anatomy and the physiology of the vertebral column which have a special interest in relation to the production of lateral curvature. There are some points in respect to the anatomical construction of the spine in which Mr. Adams differs from most anatomists. He doubts the existence of a lateral curve in the dorsal region as a normal condition of the spine, and the normal antero-posterior curves are stated to materially weaken the vertebral column. As is well known, a curve is described by anatomists, situated at the level of the third, fourth, and fifth dorsal vertebræ, and is attributed generally to the presence of the aorta. Mr. Adams opposes this almost universal belief, not only from examinations of the living but from numerous and careful observations on the dead subject, a better test, insomuch as in all lateral curvatures of the spine the deviation of the bodies of the vertebræ is much greater than that of the spinous processes. This point in anatomy is important, as a belief in the existence of a slight lateral curvature as a normal condition would lead, in a particular case, to an unsound opinion in practice. Of this Mr. Adams has recorded an example at page 25. This matter can only be determined by very accurate anatomical investigation. That the spine is weakened by the antero-posterior curves seems to us questionable, for it is demonstrated in physics that of two columns, equal in all other respects, the one presenting alternate curves will better resist vertical pressure than one that is rectilinear, by reason of the decomposition of motive force that takes place at every curve.

Mr. Adams is very careful to show that there is no anatomical analogy, so far as the mechanism of motion is concerned, between the spine and the movable articulations of the extremities. This was the more necessary, for many writers have traced out analogies between the curvatures of the spine and the deformities that occur at these joints. The spinal muscles, Mr. Adams believes, are in the state of least activity in the erect position of the spinal column, and that their functions are not to produce by active contraction any flexion or curvature of the spine, but essentially to regulate and limit its movements, and to restore the equilibrium of the spinal column when disturbed. No ligaments exist, though spoken of by some writers, which, by contraction or relaxation, could cause curvature of the spine. At the sides of the vertebræ are only to be found some short and irregular ligamentous bands, interlacing and crossing over the intervertebral cartilages. It is by the articulating processes that the lateral and the antero-posterior motions of the spine are checked. Lateral curvature cannot take place without some alteration in form of these processes, and there is always accompanying it horizontal rotation of the bodies of the vertebræ. These points in the anatomy and physiology of the spinal column are of the very highest importance in the treatment of lateral curvature. If they are true, as we believe they are, the muscular and ligamentous theory of the produc-

tion of the deformity must be erroneous, and the modes of cure based upon it should be abandoned.

The third lecture is on anterior and posterior curvatures of the spine, and is a good practical essay on these deformities.

The fourth and fifth lectures are on the external characters and morbid anatomy of lateral curvature. They are the most important chapters in the volume, and indeed give to it its particular value. The same subjects are nowhere else treated so satisfactorily, and it is only by an accurate knowledge of them, that the principles of treatment applicable to the different classes of cases of curvature that present themselves to us in practice, can be determined.

According to the generally received opinion as to the mode of production of lateral curvature, this deformity is supposed to depend primarily and essentially upon muscular debility with a lax condition of the ligaments of the spine; structural changes in the bones and intervertebral cartilages are believed to take place only at a late period.

In cases of muscular debility lateral curvature is sometimes simulated, and a certain proportion will terminate in true lateral curvature, when this is not prevented by proper treatment. Mr. Adams, however, is positive that lateral curvature as frequently exists in individuals who do not exhibit any indications of muscular debility. Such cases are described by Mr. Adams as *weak spines*, or *cases of threatened lateral curvature*. They are chiefly interesting in reference to the treatment to be adopted rather than in their pathology. There can be little doubt that *cures of spinal curvature* have been largely derived from this class of weak spines, a curvature being assumed when no real curvature existed.

Mr. Adams maintains the opinion that any case of curvature of the spine, properly so called, however slight it may be, is always accompanied by structural changes; the bodies of the vertebræ are deviated laterally in a horizontal direction, and the oblique articulating processes are altered in their direction and aspects. Moreover, he demonstrates that there may be curvature affecting the bodies of the vertebræ, sometimes very severe, when posteriorly the apices of the spinous processes are very slightly, and sometimes not at all deviated from a straight line.

Rotation of the bodies of the vertebræ has already been described by writers on spinal curvature, but this condition is regarded as a late change, a complication, or a superadded condition. Mr. Adams teaches that rotation takes place at the beginning, and forms an essential part of a series of structural changes, and that the external lateral deviation occurs subsequently rather than previous to the rotation movement.

The means of detecting by external characters this rotation of the bodies of the vertebræ are very carefully described. These characters vary, of course, according to the form and situation of the curvature. When a single curve<sup>1</sup> exists in the lumbar region, a prominence of the crest of the ilium, caused by the sinking in of the abdominal walls, corresponding to the concavity of the curve, is the most conspicuous external indication. On the side of the convexity the spinal muscles are pushed outwards. A lateral deviation of the apices of the spinous processes seldom exists in a marked degree.

<sup>1</sup> It is, of course, anatomically impossible that any such condition as a SINGLE CURVE can exist. A second curvature forms simultaneously, for the purpose of maintaining the equilibrium of the body. It is not, however, externally apparent in all cases.

When a single curve exists in the dorsal region, it generally involves a considerable length of the spinal column. The symmetrical form of the body is more disturbed in this than in any other form of lateral curvature, in consequence of the length of the curve and its relation with the thoracic parietes. The level of the shoulders is conspicuously altered, even when the curvature is slight, and as it advances one shoulder becomes permanently elevated and the other depressed. The scapulæ are unequally distant from the spinous processes, that on the convexity being more distant than the other, and also raised above the level of the opposite bone. A posterior projection of the angles of the ribs, on the side corresponding to the prominent scapula, and a depression of the angles of the ribs on the opposite side, are always found, and as the curvature increases becomes one of the most conspicuous of the external characters. The ribs become more oblique in their direction, and depressed laterally as well as posteriorly in the concavity of the curve, so that the chest sinks in and becomes obviously depressed; on the convexity of the curve the ribs are more horizontal in their direction, and more widely separated from each other, than in their natural condition. The apices of the spinous processes present a more marked lateral deviation in this than in any other form of curvature, though, even in severe cases, they afford but a very imperfect indication of the extent of the internal curvature as it affects the bodies of the vertebræ. In slight cases, though the other external characters are sufficiently well marked, the lateral deviation of the spinous processes may be scarcely perceptible.

When the curve exists in the upper and middle portion of the dorsal region, it gives a high-shouldered and short-necked appearance, and produces a disposition to stoop. The scapula on the side of the convexity is tilted forwards, and the position of the trapezius muscle just above the scapula is often very prominent, so much so as to be occasionally mistaken for fatty or cystic tumour, or a chronic abscess. This same error in diagnosis has also occurred in cases where the lumbar muscles have been remarkably prominent. The sensation of fluctuation in these muscular swellings is exceedingly deceptive.

In double lateral curvature, when the curves are only of moderate extent, and about equal to each other in length, very little external deformity exists; much less than when the curvature is single. The curvature, as affecting the bodies of the vertebræ, may be very severe, when the lateral deviation of the apices of the spinous processes is very slight. In the dorsal region, however, the natural posterior projection of the spinous processes is diminished or lost, so that a flattening exists in place of a convexity, and in more severe cases the natural curvature is to some extent reversed. A posterior projection of the angles of the ribs, on the side of the convexity of the curve, and a posterior projection of the scapula, on the same side, are constantly present. The projecting scapula, moreover, is more distant than its fellow, from the spinous processes. On the side of the convexity of the curve there is a sinking-in, or depression, of the angles of the ribs. The form of the chest may not be perceptibly altered in these cases, when slight, but generally, the breast on the side of the concavity is more prominent than the other. In the lumbar region the spinal muscles are rendered prominent on the convexity of the curve, from the projection of the transverse processes of the lumbar vertebræ, caused by the horizontal rotation of the vertebræ that always takes place.

We have presented this *résumé* of the description of the principal external

characters of spinal curvature, given by Mr. Adams, because we have never seen elsewhere these means for detecting lateral curvature so well described. It is indeed generally supposed to exist only when the apices of the spinous processes are deviated from a straight line.

In considering the morbid anatomy of lateral curvature, Mr. Adams shows that the curvature depends upon alteration in the relative thickness of the intervertebral cartilages and the bodies of the vertebræ at parts corresponding to the curvatures, that the bodies of the vertebræ are turned round horizontally, and that these alterations are associated with changes of direction in the articular facets of the oblique articulating processes. It is this spiral twist of the spine that produces the posterior projection of the transverse processes, and of the angles of the ribs, just described among the external appearances, which are more certainly to be relied upon as indicating the existence of internal curvature than any curvature in the spinous processes. The structural changes in the cartilages, irregularly compressed, when examined microscopically, are found to be essentially of an atrophic and degenerative character. The texture of the bones, examined in the same manner, presents no unhealthy appearance. In certain places it is more close and compact; change of a reparative character, and calculated to arrest the progress of the curve. The oblique processes are altered in form and direction, and present a nodulated appearance around the margins of the articular facets; changes apparently similar to those by which the articular extremities of the long bones become enlarged in what is called "chronic rheumatic arthritis." The transverse processes are not only altered in direction, but they are also materially altered in form. They may become attenuated and project backwards; or, when resting on the crest of the ilium, they may become flattened from above downwards. These changes Mr. Adams believes to always occur; and, moreover, he does not believe that they are associated with or depended upon a rachitic condition of the patient. He draws a broad line of distinction between rachitic and other classes of lateral curvature; a line that cannot be too broadly drawn, for the rachitic is the only form associated with deformity of the pelvis, and therefore the only form in which danger in child-bearing need be apprehended, or any obstacle to marriage assigned upon medical testimony. No case is rachitic when there is no curvature of the leg bones, or other bones of the skeleton, no enlargement of the epiphyses, nor rachitic conformation of the skull.

The influence of lateral curvature upon the structure of the chest and of the pelvis, and in causing displacement of the thoracic and abdominal viscera, and compression of the spinal cord and nerves, is considered in detail, but we find nothing here to note particularly. In all the dissections he has made of severe cases of spinal curvature, Mr. Adams has found the muscles on both sides of the spine much wasted, pale in colour, and in more or less advanced stages of fatty degeneration. This condition of the muscles he believes to begin in those of the concavity of the curve, those on the convexity wasting at a much later period.

The six remaining chapters of this work treat of the mode of production of lateral curvature, its symptoms, diagnosis, prognosis, and treatment. The peculiar opinions held by Mr. Adams upon these several subjects being, of course, deduced from those held by him in regard to the anatomy and physiology of the vertebral column, and the morbid anatomy of lateral curvature, of which we have just given a full analysis, may be readily understood.

The muscular theory of the production of lateral curvature, which is the theory generally received by the profession, is rejected on anatomical and physiological grounds, and also as being contradicted by facts that have come under his own observation and experience. For the same reasons he rejects the opposite theory of active muscular contraction, held by M. Guérin. That of Dr. Dods, who attributes lateral curvature to frequent and protracted voluntary muscular effort, is rejected for the same reason, and also as altogether insufficient to explain the phenomena of rotation, which Dr. Dods taught followed lateral curvature, instead of preceding it, as is really the case.

The practice of tight lacing, to which so much is attributed by many writers, above all, be it said, by those who write for the public eye, is not believed by Mr. Adams to have any injurious influence whatever in producing lateral curvature.

According to Mr. Adams, the immediate cause in every case of lateral curvature is essentially mechanical. Structural change is produced by mechanical pressure, the equilibrium of the spinal column being disturbed, and the weight of the head and upper extremities being thrown for a length of time in the same direction, from the long continuance of certain bad positions, by certain occupations, from inequality in the length of the legs, and from certain diseases, as empyema. The predisposing causes are essentially constitutional, either hereditary or acquired; such as hereditary predisposition, the strumous diathesis, and constitutional debility.

In the consideration of the general symptoms of lateral curvature, Mr. Adams naturally takes a different view from what we generally find maintained. The enfeebled condition of the general health, together with the associated functional disturbances of the internal organs of the chest and abdomen, such as palpitation of the heart, difficult respiration, derangements of the liver, stomach, and bowels, is generally regarded as the primary and essential affection to which the spinal affection is merely secondary. Mr. Adams declares, without hesitation, that these symptoms are to be regarded as essentially dependent upon the curvature of the spine, and that the proper treatment of the deformity will, in many instances, be sufficient alone to remove them all.

Among the symptoms of lateral curvature, spinal pain, or pain referred to the region of the spine, is particularly well described by Mr. Adams. We lay before our readers a good portion of his remarks on the subject, both on account of their particular value, and as affording an example of his style.

"Spinal pain, by which I mean pain referred to the region of the spine, occurs frequently as a symptom of lateral curvature both in slight and severe cases. When it exists in slight cases, I regard it as a fortunate circumstance, because attention is at once directed to the spinal affection, and the patient placed under treatment in time for a cure to be effected; but when pain is absent, and there are no other symptoms affecting the general health, as sometimes occurs in lateral curvature, those who have much experience in the treatment of these cases, know that in such patients the spinal distortion is frequently allowed to proceed to an incurable stage before any advice is sought. With such absence of pain and other symptoms, it may also happen that the external deformity is so slight as scarcely to attract attention when the girl is dressed, even though the spinal distortion exists in a marked degree.

"*Spinal pain*, then, is by no means a constant symptom of lateral curvature, nor do I recognize any general rule as to its presence or absence in any special class of cases, or any particular form of curvature; but when it does occur, it adds very much to the distress of the patient, by producing a sensation of sick-

ness and sometimes fainting, and often seriously affects the general health, which is sometimes still further impaired by the remedies adopted for relief. Hot brandy and water is frequently resorted to by some sufferers, whilst others habitually take opium; a second dose of opium taken for the relief of spinal pain at night, after the accustomed dose had failed to give the usual relief, was the cause of death in the case of Dr. Mantell, described in the previous lecture. These remedies are constantly resorted to by ladies without medical advice, but to a moderate extent we are obliged to sanction them when other means fail to give the necessary relief. A lengthened experience in private practice can alone make the surgeon familiar with the amount of real suffering, as well as mental distress, entailed upon the patient in many cases of lateral curvature of the spine in its later stages; and yet in the early stages of this affection, when it is undoubtedly curable by simple means, it is generally regarded as an unimportant affection, one which the patient, by moderate care and attention to the general health, will grow out of; or at the worst, as one not likely to become of more importance than producing a little deformity, regarded as almost a natural condition when slight, and easily compensated by the dressmaker, when more severe.

"*Spinal pain* in cases of lateral curvature, may be either *diffused* or *local*, *i. e.*, it may either be diffused over the region of the spine in its entire length, or over the dorsal or lumbar region of the spine; or it may be localized to a particular spot in the neighbourhood of the spine or ribs.

"*When diffused*, the patient complains of a dull, aching pain in the back, with a sense of great weakness, worse in the erect or sitting position, and always aggravated by walking or other exercise, so that the patient abstains from all exertion; but the pain is not removed by lying down, though it is generally much diminished. In a few exceptional cases, I have known the pain to be worse in the night-time, frequently causing the patient to wake with an acute pain, for which various remedies were obliged to be resorted to. Externally, the skin over the spine is so morbidly sensitive, that the patient shrinks from the slightest pressure; even passing the finger lightly down the spine over the spinous processes gives pain. It is said by those who consider this pain to be entirely hysterical, that a firm and continuous pressure can be borne, but it has not been so in the cases in which I have tried it.

"*The cause of this diffused spinal pain* is certainly obscure. In many cases it is undoubtedly associated with hysterical symptoms, and then the hysterical explanation at once appears to be sufficient; but in at least an equal number of cases no other indications of hysteria exist, and we meet with it in patients at all ages up to fifty or sixty. It is commonly spoken of as spinal irritation, and we should certainly expect that irritation and pain at least would result from the twisted condition of the spinal column, with a corresponding alteration in the axis, or twisted condition of the spinal cord.

"In some few cases, though probably only in rare and exceptional instances, spinal pain is associated with a true inflammatory condition. A few years ago I assisted my late colleague, Mr. Lonsdale, to make the post-mortem examination of a young lady who had been some time under his care, and had suffered from diffused spinal pain which was considered to be essentially hysterical by the late Dr. Roots and other physicians, who had seen the case in consultation with Mr. Lonsdale. This opinion was held till within three or four weeks of the young lady's death, which was preceded by complete paralysis of the lower extremities, and other symptoms clearly indicating disease of the spinal cord. At the post-mortem examination we found inflammatory effusion with suppuration extending a considerable distance along the cord and membranes, with softening of the substance of the cord itself. Such cases, though rare, must lead us to be careful in our diagnosis as to the cause of pain when we meet with it in the more severe cases.

"When *local* spinal pain exists in cases of lateral curvature, it is referred to some spot in the neighbourhood of the spine, but not constantly either to the side of the convexity or the concavity of the curve; more frequently, however, the pain is referred to the side of the convexity, and when this is to the right—its most usual direction—in the dorsal region, the pain is generally referred to

a part a little below the angle of the scapula: and in the lumbar region, the convexity of the curve being generally to the left, a very acute pain is frequently referred to about the position of the transverse processes. These processes being altered in their transversity by the movement of rotation previously described, project towards the skin, and push onwards the lumbar mass of muscles along the convexity of the curve, so as to form an external prominence in this situation, which, as I have already mentioned, has been repeatedly mistaken for abscess, the muscular swelling giving a doubtful sense of fluctuation.

"In many cases under my care, the acute pain at this particular spot, always increased by motion, and by the erect or sitting position, and relieved, but not removed, by lying down, has been the most distressing symptom of the spinal curvature; and, for the relief of this pain alone, advice is frequently sought in many adult cases, when the patient has no hope of any improvement being effected in the distortion of the spine."

The cause of this pain, localized in particular spots, may be satisfactorily traced in all cases to some of the local changes described as taking place in the various structures of the spine during the formation and increase of the curvature. It is to be attributed to mechanical pressure and parts not adapted to receive pressure. For its relief Mr. Adams relies upon the application of a belladonna plaster, from three to twelve inches in length, along the spine, and the use of a strong and well-adjusted spinal instrument to give mechanical support to the spine.

When on the subject of the diagnosis of lateral curvature, the main points of which may be readily understood from what has already been stated in regard to the external appearances, and the morbid anatomy of the deformity, Mr. Adams cites a very remarkable case, to which he refers repeatedly throughout the volume. It is that of Dr. Gideon Mantell, first recorded in the thirty-seventh volume of the *Medico-Chirurgical Transactions*, (1854), under this title: "Case of Distortion of the Spine, with Observations on Rotation of the Vertebrae as a complication of Lateral curvature: by Thos. Hodgkins, M. D., and Wm. Adams." In this case, although the internal curvature was very severe, there was scarcely any lateral deviation of the apices of the spinous processes, and the true nature of the affection was altogether overlooked. We mentioned above among the external appearances in lateral curvature, a swelling in the lumbar region, from the pushing out of the muscles by the transverse processes of the vertebrae, and said it gave a deceptive feeling of fluctuation. In the case now in question, such a swelling deceived all the eminent medical and surgical authorities who had been consulted in the case, and among them were Coulson, Stanley, Lawrence, Bright, Liston and Brodie. So positive were some of them that the swelling was one of lumbar abscess, that Liston offered to open it, but this happily was delayed.

The future progress in any case of spinal curvature is extremely uncertain, still there are certain general principles that are of service in founding a prognosis. A curvature in the dorsal region can be controlled more effectually by mechanical means than one existing in the lumbar region, where the transverse processes cannot receive the pressure that can be applied to the ribs. The predominance of the local or mechanical causes, the general health being good, the absence of an hereditary tendency, and the curvature not beginning at an early age, are among the chief points influencing the surgeon in giving a favourable prognosis. He will be influenced moreover by the extent to which the curvature had become developed at the time when advice is sought, by the age of the patient, by the form of the curve, and by the evidence of rotation of the bodies of the vertebrae existing in a marked degree.



In considering the treatment of lateral curvature, Mr. Adams carefully applies those views of the general pathology of this affection which he has maintained, and which we believe he has succeeded in establishing in this volume. All the cases of this deformity are arranged in three classes, according to the relative degree in which they can be traced to depend upon constitutional and local causes, and the treatment best suited to the various cases included therein, is described in detail.

In the first class, or those essentially of constitutional origin, of course the constitutional treatment is of the first importance. These cases are, generally, young children who have been insufficiently nourished. Cod-liver oil, used not only internally, but externally, by being rubbed over the whole body night and morning after a bath, is the most valuable remedy for improving the general health and strength. The preparations of iron and the hypophosphite of lime are very useful. The child must not be allowed to sit or stand for any length of time, and the back should be supported by some mechanical contrivance, as by a piece of strong leather, if the child is very young, accurately moulded to the form of the back, and properly held in position. In children rather older, as from seven to twelve years of age, a light steel spinal instrument is recommended, with one or two lateral plates, according to the form and situation of the curvature. It is entirely unnecessary for this apparatus to be worn at night; the recumbent position effectually removes the cause that leads to the curvature.

For the purpose of keeping the patient in a reclining position, which should be done at least one-third of the day, the use of a reclining chair is recommended, the inclination being about 45°. In this position, the weight of the head and upper extremities is effectually removed from the spinal column, and the patient does not suffer from headache, indigestion, and those other inconveniences that so frequently attend lying down upon the inclined plane, or lying flat upon the floor, as has often been recommended. As affording an agreeable change from the reclining chair, what is styled a *prone-couch* may be recommended. In this the body is supported in front, and certain occupations, as drawing, music, and needlework, are thereby facilitated. We have had one of these constructed for a female patient some fourteen years of age, and it gives great satisfaction. The use of the hand-swing, the elastic chest expander, and the drawing up a weight from the ground, are the means to be used for the gymnastic exercises best suited to these cases. When the curvature is situated chiefly in the lumbar region, the use of gymnastics in the horizontal position by means of an *exercising-plane*, is very highly recommended. They possess the great advantage of strengthening the body, and improving the general health, while, at the same time, the disadvantages of the erect position are completely removed.

The second class, or cases depending upon constitutional and local causes in about equal degrees, generally occur between the ages of twelve and sixteen years. We can generally trace, in these cases, some local cause acting mechanically, so as to disturb the equilibrium of the spinal column, such as standing on one leg, sitting cross-legged, or guarding some particular position for a length of time. Besides attention to position and to certain gymnastic exercises, these cases, when confirmed, that is, when attended by the anatomical deviations already described, require the use of spinal instruments, capable of giving firm support, and also of exerting a certain amount of active force or pressure. The instruments used by Mr. Adams in these cases are of two forms: one is a modification of the Eagland

spinal support; the other is a much stronger instrument of his own device. In his instrument mechanical force is exerted by lateral steel plates against the projecting ribs in the same plane, but in the opposite direction to that in which they have deviated from their normal position, in consequence of the rotation movement of the bodies of the vertebræ. The instrument should seldom be worn at night.

By this means cases of this kind, unless very considerable external deformity has occurred before they are submitted to treatment, are generally curable within one or two years.

Cases of the third class, that is, essentially depending upon local causes, acting mechanically, so as to disturb the equilibrium of the spinal column, require a treatment that is essentially local. Acquired bad habits must be discontinued; occupations tending to produce the curvature must be relinquished, &c. &c. Inequality in the length of the legs must be compensated for by raising the sole on the short leg. When these cases occur during the period of growth, the use of a spinal instrument may, in most cases, be recommended, either with the view of curing the curvature, when it arises from removable causes, or of preventing its increase when the curvature has advanced to an incurable degree, and when we cannot remove the cause by which it is produced.

These views of the morbid anatomy, pathology, and treatment of lateral curvature are more satisfactory to us than any we have elsewhere met with, and we desire strongly to call the attention of the profession in this country to them. The affection is here very frequently met with, while very few, indeed, of our medical practitioners understand ought of its true nature and of its proper treatment. What has been published upon the subject in this country will afford but little information. The "Report on Orthopedic Surgery," by Dr. David Prince, presented to the Illinois State Medical Society, at their meeting held in Bloomington, 1865, has some value, on account chiefly of historical information, and the description given of ingenious mechanical contrivances to be used in treatment. The paper on the pathology of the lateral curvature of the spine, by Dr. Charles Fayette Taylor, of New York, published in the fifteenth volume of the *Transactions of the American Medical Association* (1864), we feel it incumbent on us to refer to solely, in consequence of the respectability of the auspices under which it has been given to the public.

While we entertain the very highest opinion of the soundness and of the value of the views contained in this work of Mr. Adams, we are compelled to express regret at the manner in which he has laid them before the profession. There is a good deal of repetition, which fatigues the student, and at times, from a want chiefly of more methodical arrangement, it is difficult to seize the true sense and bearing of the expressions. The volume itself is very handsomely printed, and fully illustrated by plates and numerous admirably executed wood-cuts.

W. F. A.